FIITJEE INTERNAL Common Test

PHYSICS, CHEMISTRY & MATHEMATICS

QP CODE: 100856 | **Common Test-5**

Time Allotted: 3 Hours | **Maximum Marks: 180**

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

INSTRUCTIONS

Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.

A. General Instructions

1. Attempt ALL the questions. Answers have to be marked on the OMR sheets.
2. This question paper contains **Three Sections.**
3. **Section-I** is Physics, **Section-II** is Chemistry and **Section-III** is Mathematics.
4. All the section can be filled in **PART-A & B** of OMR.
5. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
6. Blank Papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

B. Filling of OMR Sheet

1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
2. On the OMR sheet, darken the appropriate bubble with ***Blue/Black Ball Point Pen*** for each character of your Enrolment No. and write in ink your Name, Test Centre and other details at the designated places.
3. OMR sheet contains alphabets, numerals & special characters for marking answers.

C. Marking Scheme For All Two Parts.

(i) **Part-A (01-04) –** Contains Four (04) multiple choice questions which have ONLY ONE CORRECT answer Each question carries **+3 marks** for correct answer and **-1 marks** for wrong answer.

(ii) **PART–A** (**05–07)** contains **(3**) Multiple Choice Questions which have **One or More Than One Correct** answer.
Full Marks: **+4** If only the bubble(s) corresponding to all the correct options(s) is (are) darkened.
Partial Marks: **+1** For darkening a bubble corresponding **to each correct option,** provided NO incorrect option is darkened.
Zero Marks: **0** If none of the bubbles is darkened.
***Negative Marks*: –1 In all other cases.**
For example, if **(A), (C) and (D)** are all the correct options for a question, darkening all these three will result in **+4 marks**; darkening only **(A) and (D)** will result in **+2 marks**; and darkening **(A) and (B)** will result in **–1** marks, as a wrong option is also darkened.

(iii) **Part-A (08-11) –** This section contains Four (04) Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question. Each question carries **+3 Marks** for correct answer and **-1 marks** for wrong answer.

(iii) **Part-B (01-06)** This section contains **SIX (06)** questions. The answer to each question is a **NON-NEGATIVE INTEGER**. For each question, enter the correct integer corresponding to the answer. Each question carries **+4 marks** for correct answer. **There is no negative marking.**

Name of the Candidate: _____

Batch: _____ **Date of Examination:** _____

Enrolment Number: _____

BATCHES – PANINI426-G1, A1, A2 & PANINI426-B1

SECTION – I: PHYSICS

(PART – A)

(Single Correct Answer Type)

This section contains **4 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.**

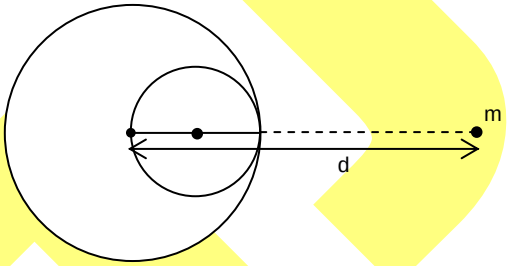
1. A geostationary satellite is orbiting the earth at a height of 6 R above the surface of earth, R being the radius of earth. The time period of another satellite at a height of 2.5 R from the surface of earth is

(A) $6/\sqrt{2}$ hr (B) 10 Hr (C) 6 hr (D) $6\sqrt{2}$ hr

2. A body is projected vertically upwards from the earth's surface to reach a height 7R, where R is the Radius and M is mass of earth. The minimum velocity required to do so is

(A) $\sqrt{\frac{7GM}{8R}}$ (B) $\sqrt{\frac{7GM}{4R}}$ (C) $\sqrt{\frac{8GM}{3R}}$ (D) $\sqrt{\frac{20}{11}\frac{GM}{R}}$

3. A spherical hollow is made in a lead sphere of radius R such that its surface touches the outside surface of the lead sphere and passes through it centre. Mass of lead sphere before hollowing is M. A particle of mass 'm' is placed at a distance 'd' from the centre of the lead sphere and on the lien joining the centre of the sphere and the centre of the hollow as shown. Force of attraction between the hallowed sphere and the particle



(A) $\frac{GMm}{4d^2}$ (B) $\frac{GMm}{d^2}\left[1+\frac{1}{6\left(1+\frac{R}{2d}\right)^2}\right]$

(C) $\frac{GMm}{d^2}\left[1-\frac{1}{8\left(1-\frac{R}{2d}\right)^2}\right]$ (D) $\frac{GMm}{d^2}\left[1+\frac{1}{8\left(1+\frac{R}{2d}\right)^2}\right]$

Space For Rough Work

4. A simple pendulum has a time period T_1 when on earth's surface and T_2 when taken to a height R above the earth's surface. R is the radius of the earth. The value of T_2/T_1 is

(A) 1 (B) $\sqrt{2}$ (C) 4 (D) 2

(One or More Than One Options Correct Type)

This section contains **3 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE** or **MORE THAN ONE is correct.**

5. Inside a uniform spherical shell:

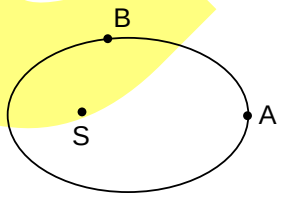
(A) potential is zero (B) field is zero
(C) potential is constant (D) field is constant

6. The magnitude of gravitational field at distance r_1 and r_2 from the centre of a uniform sphere of radius R and mass M are I_1 and I_2 respectively. Then

(A) $\frac{I_1}{I_2}=\frac{r_1}{r_2}$ if $r_1<R$ and $r_2<R$ (B) $\frac{I_1}{I_2}=\frac{r_2^2}{r_1^2}$ if $r_1>R$ and $r_2>R$

(C) $\frac{I_1}{I_2}=\frac{r_1}{r_2}$ if $r_1>R$ and $r_2>R$ (D) $\frac{I_1}{I_2}=\frac{r_1^2}{r_2^2}$ if $r_1<R$ and $r_2<R$

7. A planet is moving round the sun in an elliptical orbit as shown.
As the planet moves from A to B
(A) its kinetic energy will decrease
(B) its potential energy will remain unchanged
(C) its angular momentum about centre of sun will remain unchanged
(D) its speed is minimum at A



Space For Rough Work

(Matching List Sets)

This section contains **FOUR (04)** Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

8. A planet of mass M, has two natural satellites with masses m_1 and m_2. The radii of their circular orbits are R_1 and R_2 respectively. Ignore the gravitational force between the satellites. Define v_1, L_1, K_1 and T_1 to be, respectively, the orbital speed, angular momentum, kinetic energy and the time period of revolution of satellite 1; and v_2, L_2, K_2 and T_2 to be the corresponding quantities of satellite 2. Given $m_1/m_2 = 2$ and $R_1/R_2 = 1/4$, match the ratios in List–I to the numbers in List–II.

List-I		List-II	
(P)	$\frac{v_1}{v_2}$	(1)	$\frac{1}{8}$
(Q)	$\frac{L_1}{L_2}$	(2)	1
(R)	$\frac{K_1}{K_2}$	(3)	2
(S)	$\frac{T_1}{T_2}$	(4)	8

The correct option is:

(A) P $\rightarrow$ 4 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 1 ; S $\rightarrow$ 3 (B) P $\rightarrow$ 3 ; Q $\rightarrow$ 2 ; R $\rightarrow$ 4 ; S $\rightarrow$ 1

(C) P $\rightarrow$ 2 ; Q $\rightarrow$ 3 ; R $\rightarrow$ 1 ; S $\rightarrow$ 4 (D) P $\rightarrow$ 2 ; Q $\rightarrow$ 3 ; R $\rightarrow$ 4 ; S $\rightarrow$ 1

9. For two particles describing circular path under mutual gravitational force of attraction.

List-I		List-II	
(P)	If speed of the particles decreases such that velocity of centre of mass remains zero, then	(1)	particle separation will increase
(Q)	If one of the particles stops then	(2)	particle separation will decrease
(R)	If both particle stops for a moment then	(3)	common centre will lie on centre of mass
(S)	If speed of both particles increase such that velocity of centre of mass remains zero.	(4)	particle collide at centre of mass

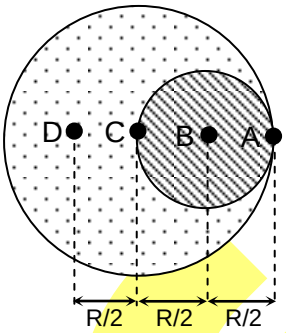
The correct option is:

(A) P $\rightarrow$ 1,4 ; Q $\rightarrow$ 1 ; R $\rightarrow$ 2,3 ; S $\rightarrow$ 3 (B) P $\rightarrow$ 1,2 ; Q $\rightarrow$ 3 ; R $\rightarrow$ 2,4 ; S $\rightarrow$ 1,3

(C) P $\rightarrow$ 1,2 ; Q $\rightarrow$ 4 ; R $\rightarrow$ 2,3 ; S $\rightarrow$ 1,4 (D) P $\rightarrow$ 1,3 ; Q $\rightarrow$ 1 ; R $\rightarrow$ 2,4 ; S $\rightarrow$ 2,3

Space For Rough Work

10. Gravitational potential on the surface of an isolated uniform solid sphere of mass M and radius R is found to be V_0. A spherical cavity having radius R/2 is created inside the sphere which is touching the surface of original sphere. The cavity is then filled with material having density 16 times that of original sphere. A, B, C and D are consecutive points as shown in the figure each R/2 apart. V_A, V_B, V_C and V_D are gravitational potentials found at points A, B, C and D respectively.



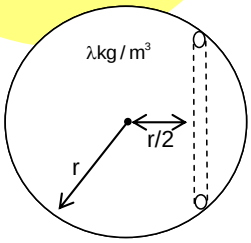
List-I		List-II	
(P)	V_A	(1)	$7V_0$
(Q)	V_B	(2)	$13/4\ V_0$
(R)	V_C	(3)	$19/4\ V_0$
(S)	V_D	(4)	$21/4\ V_0$
		(5)	$25/4\ V_0$

The correct option is:

(A) P → 3 ; Q → 1 ; R → 4 ; S → 2 (B) P → 3 ; Q → 5 ; R → 2 ; S → 1

(C) P → 3 ; Q → 1 ; R → 2 ; S → 4 (D) P → 2 ; Q → 3 ; R → 4 ; S → 5

11. Consider a planet of radius r having density λ. A tunnel is dug inside it at a distance r/2 from its centre as shown. An object of mass m is left in the tunnel at the surface at t = 0 then



List-I		List-II	
(P)	Time taken by the object to reach the mid of the tunnel	(1)	Zero
(Q)	Magnitude of velocity of object at the centre of the tunnel	(2)	g
(R)	Normal reaction applied by wall of the tunnel on the object	(3)	$\sqrt{\frac{3\pi}{16G\lambda}}$
(S)	Acceleration of object when it reach the mid of the tunnel	(4)	$\frac{2}{3}\pi G\lambda r\,m$
		(5)	$\left(\sqrt{\pi 6\lambda}\right) r$

The correct option is:

(A) P → 3 ; Q → 1 ; R → 5 ; S → 2 (B) P → 3 ; Q → 5 ; R → 4 ; S → 1

(C) P → 4 ; Q → 5 ; R → 2 ; S → 3 (D) P → 3 ; Q → 2 ; R → 1 ; S → 4

Space For Rough Work

(PART – B)

(Non – Negative Integer)

1. A satellite is moving in a circular orbit around earth at a height R above earth surface (R being radius of earth). It's velocity should be increased to K times its initial orbital speed value, so as to make it escape from earth gravitational pull and reach infinity. Find the value of "K^2"

2. If the mass of the planet that has a satellite whose time period is T and orbital radius r is $\frac{K\pi^2 r^3}{4GT^2}$, then the value of 'K' is

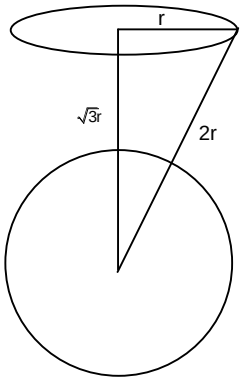
3. A satellite is revolving round the earth in a circular orbit of radius "r" and velocity V_o. A body is projected from the satellite in forward direction with relative velocity $V_{rel} = \left(\sqrt{\frac{5}{4}} - 1\right) V_o$.

   If ratio of minimum and maximum distances from earth's centre during subsequent motion of the particle is K, then value of 10 K will be?

4. Three particles, each of mass m, are situated at the vertices of an equilateral triangle of side length a. The only forces acting on the particles are their mutual gravitational forces. It is desired that each particle moves in a circle while maintaining the original mutual separation a. Find the initial velocity that should be given to each particle. $\left(\text{take } a = \frac{GM}{16}\right)$

5. A rocket is fired form the earth to the moon. The distance between the earth and the moon is r and the mass of the earth is 81 times the mass of the moon. The gravitational force on the rocket will be zero, when its distance from the moon is μr. Find the value of '10μ'.

6. A uniform ring of mass m and radius r is placed directly above a uniform sphere of mass M and of equal radius. The centre of the ring is directly above the centre of the sphere at a distance $r\sqrt{3}$ as shown in the figure. The gravitational force exerted by the sphere on the ring will be $\sqrt{k}\frac{GMm}{8r^2}$ then find the value of 'k'.



Space For Rough Work

SECTION – II: CHEMISTRY

(PART – A)

(Single Correct Answer Type)

This section contains **4 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.**

1. In a chemical reaction, $A(g)+2B(g)\overset{K_C}{\rightleftharpoons}2C(g)+D(g)$, the initial concentration of B was 1.5 times of the concentration of A, but the equilibrium concentrations of A and B were found to be equal. The equilibrium constant(K_c) for the aforesaid chemical reaction is
   (A) 16 (B) 4
   (C) 1 (D) 1/4

2. The correct relations between K_P and K_C for the reaction $aX+bY\rightleftharpoons bZ+aW$ is
   (A) $K_p = K_c[RT]^{a+b}$ (B) $K_p=\frac{K_c}{(a+b)^2}$
   (C) $K_p = K_c[RT]$ (D) $K_p = K_c$

3. The ratio of degree of dissociation of HCN($K_a = 10^{-9}$) in its 0.1 M and 0.001 M solution:
   (A) 0.1 (B) 0.2
   (C) 0.3 (D) 0.4

4. pK_a of a weak acid(HA) and pK_b of a weak base(BOH) are 3.2 and 3.4 respectively. The pH of their salt(AB) solution is
   (A) 7.2 (B) 6.9
   (C) 7.0 (D) 1.0

(One or More Than One Options Correct Type)

This section contains **3 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE** or **MORE THAN ONE is correct.**

5. The equilibrium $SO_2Cl_2(g)\rightleftharpoons SO_2(g)+Cl_2(g)$ is attained at 25°C in a closed container at constant P. An inert gas, helium is introduced now. Which of the following statements are incorrect when equilibrium is restablished?
   (A) Concentrations of SO_2, Cl_2 and SO_2Cl_2 change
   (B) More Cl_2 is formed
   (C) Concentration of SO_2 is reduced
   (D) More SO_2Cl_2 is formed

6. Which are buffer mixtures?
   (A) HCN and NaCN (B) NaOH and $NaNO_3$
   (C) CH_3COONa and CH_3COOH (D) NH_4OH and NH_4Cl

Space For Rough Work

7. The given aqueous solution at 25°C is

(A) acidic if $[H^+] < \sqrt{K_w}$ (B) alkaline if $[H^+] < \sqrt{K_w}$

(C) acidic if $[H^+] > \sqrt{K_w}$ (D) neutral if $[H^+] = \sqrt{K_w}$

(Matching List Sets)

This section contains **FOUR (04)** Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

8. Match the lists.

List – I		List– II	
(P)	$CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$	(1)	$K_p > K_c$ above room temperature
(Q)	$CO(g) + Cl_2(g) \rightleftharpoons COCl_2(g)$	(2)	$K_p = K_c$ above room temperature
(R)	$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$	(3)	$K_p < K_c$ above room temperature
(S)	$HCl(g) \rightleftharpoons H^+(aq) + Cl^-(aq)$	(4)	K_p and K_c not defined
		(5)	$K_p = K_c$ change with temperature

(A) P → 1; Q → 3; R → 2; S → 4 (B) P → 3; Q → 4; R → 2; S → 1

(C) P → 4; Q → 2; R → 1; S → 3 (D) P → 2; Q → 3; R → 1; S → 4

9. Match the lists.

List – I		List– II	
(P)	Pressure increased in $2NO(g) \rightleftharpoons N_2(g) + O_2(g)$	(1)	Equilibrium shifted in forward direction
(Q)	Pressure increased in $CH_4(g) + H_2O(\ell) \rightleftharpoons CO(g) + 3H_2(g)$	(2)	Equilibrium shifted in backward direction
(R)	Temperature increased and pressure increased $3O_2(g) \rightleftharpoons 2O_3(g);\ \Delta H = 285\,kJ$	(3)	Equilibrium remains unaffected
(S)	Pressure decreased and mole of N_2 increased $N_2(g) + 2O_2(g) \rightleftharpoons 2NO_2(g);\ \Delta H = 66.4\,kJ$	(4)	Theoretically we cannot predict
		(5)	Equilibrium initially shift in backward direction then shift in forward direction

(A) P → 5; Q → 3; R → 2; S → 4 (B) P → 3; Q → 2; R → 1; S → 4

(C) P → 4; Q → 5; R → 1; S → 3 (D) P → 1; Q → 2; R → 4; S → 3

Space For Rough Work

10. Match the lists.

List – I (Salts)		List– II (Solubility products)	
(P)	Mercurous iodide	(1)	108 S^5
(Q)	Aluminium phosphate	(2)	4 S^3
(R)	Calcium phosphate	(3)	S^2
(S)	Zirconium(IV) phosphate	(4)	6912 S^7
		(5)	27 S^4

(A) P → 2; Q → 3; R → 1; S → 4
(B) P → 4; Q → 5; R → 1; S → 2
(C) P → 2; Q → 1; R → 4; S → 5
(D) P → 4; Q → 2; R → 5; S → 3

11. Match the lists.

List – I (Salts)		List– II (pH of aqueous solution)	
(P)	Salt of weak acid and weak base	(1)	pH = 1/2[pK_w + pK_a + logC]
(Q)	Salt of weak acid and strong base	(2)	pH = 1/2[pK_w + pK_a – pK_b]
(R)	Salt of strong acid and strong base	(3)	pH = 1/2[pK_w - pK_b - logC]
(S)	Salt of strong acid and weak base	(4)	pH = 1/2[pK_w]
		(5)	pH = 1/2[pK_a - logC]

(A) P → 1; Q → 2; R → 3; S → 4
(B) P → 2; Q → 5; R → 1; S → 4
(C) P → 1; Q → 5; R → 2; S → 3
(D) P → 2; Q → 1; R → 4; S → 3

(PART – B)

(Non – Negative Integer)

1. In the reaction: $C(s) + CO_2(g) \rightleftharpoons 2CO(g)$, the equilibrium pressure is 6 atm. If 50% of CO_2 reacts than K_p of the reaction is…..

2. For the reaction $A(g) \rightleftharpoons B(g)$ at 495 K, $\Delta_r G^o$ = -9.478 kJ mol^{-1}. If we start the reaction in a closed container at 495 K with 22 millimoles of A, the amount of B in the equilibrium mixture is _____ millimoles(Round off to the nearest integer).
[R = 8.314 J mol^{-1} K^{-1}; ln 10 = 2.303]

Space For Rough Work

3. The pH of a solution obtained by mixing 10 mL of 0.45 M HCl and 40 mL of 0.1 M NaOH is_____

4. A certain buffer solution equals concentration of X^- and HX. K_b for X^- is 10^{-10}. The pH of buffer is _____

5. What is the minimum pH required for the precipitation of ZnS in a solution from 0.01 M $ZnCl_2$ saturated with 0.10 M H_2S? (Given $K_{sp(ZnS)} = 10^{-21}$ $K_{a_1} \times K_{a_2} = 10^{-20}$ for H_2S)

6. A mixture of A(g), B(g) and C(g) at equilibrium has a average molecular weight 80. According to the reaction

$$A(g) \rightleftharpoons B(g) + C(g)$$

The degree of dissociation of A(g) is _____ $\times 10^{-2}$:
(Given: mol. wt of A = 100; mol.wt. of B = 60; mol wt of C - 40)

Space For Rough Work

SECTION – III: MATHEMATICS

(PART – A)

(Single Correct Answer Type)

This section contains **4 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE is correct.**

1. The sequence $\log a, \log\frac{a^2}{b}, \log\frac{a^3}{b^2}, \ldots\ldots$ is
   (A) a G.P (B) an A.P
   (C) an H.P (D) none of these

2. The number of terms common to the two A.Ps $2+5+8+11+\ldots+98$ and $3+8+13+18+23+\ldots 198$
   (A) 33 (B) 40
   (C) 7 (D) none of these

3. If the fifth term of a G.P. is 2, then the product of its first 9 terms is
   (A) 256 (B) 512
   (C) 1024 (D) None of these

4. The eccentricity of the ellipse $\frac{x^2}{a^2+2}+\frac{y^2}{a^2+3}=1$ *is* $\frac{1}{3}$ then Length of latus rectum is
   (A) $\frac{3}{\sqrt{2}}$ (B) $\frac{3}{2}$
   (C) $\frac{16}{3}$ (D) none of these

(One or More Than One Options Correct Type)

This section contains **3 multiple choice questions.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONE** or **MORE THAN ONE is correct.**

5. The equation of the conic with focus at (1, –1), directrix along x –y + 1 = 0 and with eccentricity $\sqrt{2}$ is
   (A) $x^2 - y^2 = 1$ (B) xy = 1
   (C) 2xy –4x + 4y + 1= 0 (D) 2xy + 4x – 4y – 1= 0

Space For Rough Work

6. Equation of tangent to the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ which cuts off equal intercepts on the axes is

(A) $x+y-\sqrt{41}=0$ (B) $x-y+\sqrt{41}=0$ (C) x + y – 9 = 0 (D) x – y + 9 = 0

7. If $(x+2)^2+(y-4)^2=k^2\frac{(3x+y+2)^2}{100}$ represents a hyperbola then the integral value of k can be

(A) 2 (B) 3 (C) 4 (D) 5

(Matching List Sets)

This section contains **FOUR (04)** Matching List Sets. Each set has **ONE** Multiple Choice Question. Each set has **TWO** lists: **List-I** and **List-II**. **List-I** has **Four** entries (P), (Q), (R) and (S) and **List-II** has **Five** entries (1), (2), (3), (4) and (5). **FOUR** options are given in each Multiple Choice Question based on **List-I** and **List-II** and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question.

8. Match the Column

List – I **Equation of tangent of conic is given**		**List – II** **Equation of tangent is given**	
(P)	$\frac{x^2}{9}+\frac{y^2}{25}=1$	(1)	$x+y=\sqrt{7}$
(Q)	$\frac{(x-1)^2}{4}+\frac{(y-3)^2}{1}=1$	(2)	$x+y=3\sqrt{2}$
(R)	$\frac{(x+y-1)^2}{18}+\frac{(x-y+3)^2}{32}=1$	(3)	$5x+3y=15\sqrt{2}$
(S)	$\frac{x^2}{3}+\frac{y^2}{4}=1$	(4)	$x+y=4+\sqrt{5}$
		(5)	$x+y=4-\sqrt{3}$

(A) P→(3); Q →(4); R→(2); S→(1) (B) P→(3); Q → (4); R→(1); S→(2)
(C) P→(3); Q → (1); R→(4); S→(2) (D) P→(3); Q → (1); R→(4); S→(1)

9. Match the Column

List – I		**List – II**	
(P)	Minimum value of $\cos^2\theta+\sec^2\theta$ is	(1)	2
(Q)	Minimum value of $\frac{a+b}{c}+\frac{b+c}{a}+\frac{c+a}{b}$ is (where $a,b,c\in R^+$)	(2)	20
(R)	If $a_1,a_2,a_3,.....a_{10}\in R^+$ such that $a_1.a_2.a_3,.....a_{10}=2^9$ then minimum value of $a_1+a_2+a_3+.....+2a_{10}$ is	(3)	1
(S)	If $x,y\in R^+$ such that $2x+3y=5$ then maximum value of x^2y^5 is	(4)	10
		(5)	6

(A) P→(1); Q →(2); R→(2); S→(1) (B) P→(1); Q → (5); R→(2); S→(3)
(C) P→(3); Q → (1); R→(4); S→(2) (D) P→(3); Q → (4); R→(2); S→(1)

Space For Rough Work

10. Equation of hyperbola is $xy-3x+4y-16=0$ then

List – I		List – II	
(P)	Asymptote equation is	(1)	$y-3=0$
(Q)	Transverse axis is	(2)	$x+y+1=0$
(R)	Conjugate axis is	(3)	$x+4=0$
(S)	Line parallel to directrix	(4)	$x-y+7=0$
		(5)	$x-y-7=0$

(A) P→(1); Q →(2); R→(2); S→(1) (B) P→(3); Q → (4); R→(1); S→(2)
(C) P→(1), (3); Q → (4); R→(2); S→(2) (D) P→(3); Q → (4); R→(2); S→(1)

11. Match the Column

List – I		List – II	
(P)	Ordinate of foci of the ellipse $4x^2+9y^2+8x-18y+4=0$ is	(1)	4
(Q)	Abssica of the centre of ellipse $3x^2+4y^2-6x-16y=0$ is	(2)	2
(R)	If e is eccentricity of ellipse $3x^2+4y^2=1$ then $2e=$	(3)	1
(S)	Maximum distance between two points of ellipse $5x^2+4y^2=20$ is	(4)	0
		(5)	6

(A) P→(1); Q →(2); R→(2); S→(1) (B) P→(3); Q → (4); R→(1); S→(2)
(C) P→(3); Q → (1); R→(4); S→(2) (D) P→(3); Q → (3); R→(3); S→(1)

(PART – B)

(Non – Negative Integer)

1. The sum of first 24 terms of an A.P $a_1,a_2,a_3,.....$; if it is known that $a_1+a_5+a_{10}+a_{15}+a_{20}+a_{24}=225$, is equal to

2. Three non-zero numbers a, b and c are in A.P.. Increasing a by 1 or increasing c by 2 the number become in G.P., then $\frac{b}{3}$ equals to

3. If the tangents on the ellipse $4x^2+y^2=8$ at the points (1, 2) and (a, b) are perpendicular to each other, then $17a^2$ is equal to:

4. If e and e' be the eccentricities of a hyperbola and its conjugate then the value of $\frac{1}{e^2}+\frac{1}{e'^2}=$

5. The product of the lengths of perpendiculars drawn from focus to any tangent to the hyperbola $9x^2-16y^2=144$ will be

6. If $a,b,c\in R^+$ such that $abc=1$ then minimum value of $(a+b)(b+c)(c+a)$ is

Space For Rough Work

FIITJEE INTERNAL TEST

BATCHES – PANINI426-G1, A1, A2 & PANINI426-B1

Common Test – 5

Code: 100856

JEE ADVANCED LEVEL

ANSWER KEY

ANSWER KEYS

Physics

PART – A

1.	D	2.	B	3.	C	4.	D
5.	BCD	6.	AB	7.	CD	8.	B
9.	D	10.	A	11.	B		

PART – B

1.	2	2.	16	3.	6	4.	4
5.	1	6.	3				

Chemistry

PART – A

1.	B	2.	D	3.	A	4.	B
5.	CD	6.	ACD	7.	BCD	8.	A
9.	B	10.	A	11.	D		

PART – B

1.	8	2.	20	3.	2	4.	4
5.	1	6.	25				

Mathematics

PART – A

1.	B	2.	C	3.	B	4.	C
5.	C	6.	AB	7.	CD	8.	A
9.	B	10.	C	11.	D		

PART – B

1.	900	2.	4	3.	2	4.	1
5.	9	6.	8				